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EXAMINER

LEADER, WILLIAM T

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/510,137	Applicant(s) MOECKL, GERHARD	
	Examiner WILLIAM T. LEADER	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 February 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 14-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 14-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>2/01/2010</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Receipt of applicant's response filed on February 1, 2010, is acknowledged. New claim 28 has been presented. Claims 14-28 are pending.
2. Receipt of the certified translation of German patent application no. 102 14 618.7 on which foreign priority is based is acknowledged.
3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 112

4. Claims 14-28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
5. The term "significant" in independent claim 14, line 9 is a relative term which renders the claim indefinite. The term "significant" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Claims 15-28 depend directly or indirectly from claim 14 and are rejected for the reasons set forth with respect to claim 14.

6. Claims 14 and 16-28 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a medium which is an electrolyte solution, does not reasonably provide enablement for other media. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to practice the invention commensurate in scope with these claims.

Independent claim 14 recites process according to an electrochemical processing. Claim 15 recites that the medium of claim 14 is an electrolytic solution. Based on applicant's specification, it does not appear that the electrochemical processing recited in claim 14 can be conducted in the absence of an electrolyte solution.

Claim Rejections - 35 USC § 102

7. Claims 14-17 and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Müll (US 5,415,761).

8. The Müll patent is directed to an electrochemical process for depositing material onto a workpiece. See the abstract. A workpiece such as a steel roller is connected as the cathode, and anodes made of a material such as platinized titanium are provided (column 5, lines 65-68). The roller is immersed in a chromium electrolyte (column 6, lines 10-13). As shown in figure 3, a basic pulse is first applied. The basic pulse has an initial edge with a rise (i.e., a ramp) of approximately 0.25 V/5 S from zero up to about 4 volts (column 6, lines 38-47). Following the application of the basic pulse, an initial pulse which has a forward edge with a constant rise (i.e., a ramp) of approximately 0.3V/5 S from zero up to an amplitude of 5V is applied (column 6, lines 48-52). At the lower end of this voltage range near zero, no processing will occur. Thus, the voltage is increased

prior to the occurrence of processing. The initial pulse is followed by a follow-up pulse. The follow-up pulse increases at 0.1V /5 S until a maximum current of 950 A is reached (column 6, lines 52-62). As the voltage increases, the point at which processing begins is passed as voltage ramps to the final value. Increasing the voltage until the desired maximum current is reached indicates that current was monitored.

9. With respect to claim 15, as noted above, the medium of Müll is an electrolyte solution.
10. With respect to claim 16, as shown by figure 3 the voltage of Müll ramps up from the value at point A to the maximum value.
11. With respect to claim 17, Müll figure 3 shows that the voltage is lowered via a ramp.
12. With respect to claim 24 Müll discloses that the distance between the anode and the cathode is between 10 and 40 cm, in particular 25 cm (column 3, lines 51-54).

Claim Rejections - 35 USC § 103

13. Claims 14, 15, 16, 18, 19, 24 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Frembgen (US 5,225,053) in view of Marson et al (US 5,077,486); or Orolin et al (US 6,391,184); or Matthes (US 4,331,524) combined with Pelly (US 6,038,155).
14. The Frembgen patent is interpreted and applied as in the previous office action. Frembgen discloses that tool 116 is provided with a current supply terminal 18 and connected as cathode to a dc power source 52 shown schematically in figure 5 (column 2, line 67 to column 3, line 1). As pointed out by applicant at page 8 of the Remarks, figure

4 of Frembgen shows the sudden application of a working voltage of 12 volts.

Independent claim 14 has been amended to recite increasing the voltage prior to a significant processing of the workpiece.

15. The Marson et al patent is directed to the power supply for an electrochemical cathodic protection system (column 1, lines 1-46). Marson teaches that high current transients may overstress components during startup. To overcome this problem, a soft-start technique is implemented where output current is ramped up from zero to full value at turn-on (column 17, lines 51-56)

16. The Orolin et al patent is directed to the electrolytic decontamination of groundwater by electrochemically generating hydrogen and oxygen. See the abstract. The control unit may include a soft start circuit which allows current to ramp up from its initial "off" condition to the specified value over a period of several seconds. This provides more even current dispersion across the electrode plates (column 11, lines 63-67). The soft-start circuit improves performance and extends the life of the electrolytic cell (column 12, lines 39-42).

17. The Mattes patent is directed to a process for electrolytic metal processing. As shown in figure 1, workpiece 14 and processing electrode 16 are separated by an operating gap 18 which is filled with a liquid electrolyte 19 (column 4, lines 40-57). The workpiece and electrode are connected to a source of direct current so that material is removed from the workpiece (column 4, lines 58-62) The source of directed current includes rectifier bridge 7 (column 4, line 29).

18. The Pelly patent is directed to a rectifier bridge circuit. A soft-start circuit is provided. See the abstract. The soft-start circuit limits in-rush current at start-up

(column 1, lines 19-22). The soft-start circuit provides an output voltage which substantially linearly ramps from a low initial value to a relatively high final value and controls charge-up current into the bus capacitor (column 2, lines 3-7).

19. The prior art of record is indicative of the level of skill of one of ordinary skill in the art. It would have been obvious at the time the invention was made to have provided the power supply of Frembgen with a soft-start circuit as disclosed by Marson et al or Orolin et al because high current transients that may overstress components during startup would have been avoided, and the life of the electrolytic cell would have been extended. Likewise it would have been obvious to have utilized a power supply which included a bridge rectifier as taught by Mattes in the process of Frembgen because such power supplies are useful in providing dc current to processes for electrochemically removing material from a workpiece, and to have provided the rectifier bridge power supply with a soft-start circuit as taught by Pelly because in-rush current at start-up would have been limited. By using a soft-start circuit in Frembgen as taught by the secondary references, rather than the sudden application of a working voltage of 12 volts as shown in figure 4, the initial voltage would have been ramped-up thereby increasing voltage prior to significant processing.

20. With respect to new claim 28, Frembgen teaches that gap resistance is one of parameters used in controlling the process. See claim 3.

21. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Frembgen (US 5,225,053) in view of Marson et al (US 5,077,486); or Orolin et al (US 6,391,184); or Matthes (US 4,331,524) combined with Pelly (US 6,038,155) as applied to claims 14,

15, 16, 18, 19, 24 and 28 above, and further in view of Hey et al (US 6,551,488) or England (US 5,004,528) for the reasons of record.

22. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Frembgen (US 5,225,053) in view of Marson et al (US 5,077,486); or Orolin et al (US 6,391,184); or Matthes (US 4,331,524) combined with Pelly (US 6,038,155) as applied to claims 14, 15, 16, 18, 19, 24 and 28 above, and further in view of Manning et al (US 3,635,802) for the reasons of record.

23. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Frembgen (US 5,225,053) in view of Marson et al (US 5,077,486); or Orolin et al (US 6,391,184); or Matthes (US 4,331,524) combined with Pelly (US 6,038,155) as applied to claims 14, 15, 16, 18, 19, 24 and 28 above, and further in view of Osano et al (US 5,503,730) for the reasons of record.

24. Claims 22, 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Frembgen (US 5,225,053) in view of Marson et al (US 5,077,486); or Orolin et al (US 6,391,184); or Matthes (US 4,331,524) combined with Pelly (US 6,038,155) as applied to claims 14, 15, 16, 18, 19, 24 and 28 above, and further in view of Altena et al (US 6,214,200) for the reasons of record.

25. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Frembgen (US 5,225,053) in view of Marson et al (US 5,077,486); or Orolin et al (US 6,391,184);

or Matthes (US 4,331,524) combined with Pelly (US 6,038,155) as applied to claims 14, 15, 16, 18, 19, 24 and 28 above, and further in view of Altena et al (US 6,214,200) or Henri et al US 6,440,291) for the reasons of record.

Response to Arguments

26. Applicant's arguments filed February 1, 2010, have been fully considered but they are not persuasive. With respect to the rejection under 35 U.S.C. 112, first paragraph, at page 8 of the Remarks, applicant states that the ability to implement the method according to the present invention in a non-electrochemical process would be understood by one skill in the art. This argument relating to non-electrochemical processes is not convincing because independent claim 14 recites an electrochemical process.

27. It is additionally noted that as indicated at page 1, lines 6-10 of applicant's specification, an applied voltage generates a current flow between the electrode and workpiece through a working medium, which is an electrolyte solution in electrochemical material processing. Examples of electrolyte solutions used in electrochemical processing are given at page 4, lines 12-17 of applicant's specification and include a sodium chloride solution or a sodium nitrate solution. In a sodium chloride solution, the sodium chloride dissociates into sodium ions and chloride ions which serve to carry electric current through the solution. Applicant's Figure 1 shows the graphic characteristic of voltage and current over time during an electrochemical material processing. The horizontal axis represents time and extends from zero to 120. While not labeled, the units are taken to be seconds. Figure 1 shows the voltage ramping up over a period extending from about 5 to about 20 seconds.

28. Non-electrochemical processes such as spark erosion (electric discharge machining) are fundamentally different than electrochemical processes. As explained in US patent 4,535,217 to de Bruyn, in a spark erosion process a pulsed-shaped voltage is applied across an electrically conductive electrode and an electrically conductive workpiece with an electrically non-conductive (dielectric) liquid present between them. Some time after the pulse-shaped voltage has reached a first value, a discharge takes place between the electrode and workpiece. The electrical energy of the discharge is dissipated in the workpiece material and the resultant, extremely high temperatures occurring at the discharge location causes the workpiece material to melt and evaporate. The material removed is carried off the by dielectric being circulated. See column 1, lines 16-40). The voltage pulses occur at a pulse interval t_0 . In a fine machining process the duration of a discharge is approximately 10 μsec and in a coarse machining process approximately 500 μsec . Thermal evaporation of material in spark erosion is completely different from electrochemical removal.

29. Applicant's argument fails to explain how one of ordinary skill in the art would be able to implement the disclosed electrochemical process using an electrolyte solution in a non-electrolytic process such as spark erosion. For example, applicant has not pointed to any teaching in the specification which would guide one how to increase the voltage via a ramp when the voltage is being applied as pulses lasting only 10 μsec and each pulse must have sufficient voltage to cause a discharge to take place. Increasing voltage from zero to a process voltage sufficient to create a discharge in less than 10 μsec is almost instantaneous.

30. The arguments with respect to the rejections of the claims based on Frembgem have been considered, but are moot in view of the new grounds of rejection.

Conclusion

31. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to WILLIAM T. LEADER whose telephone number is (571) 272-1245. The examiner can normally be reached on Mondays-Thursdays and alternate Fridays, 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/William Leader/
May 7, 2010

/PATRICK RYAN/
Supervisory Patent Examiner, Art Unit 1795